

Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1-38. (cancelled)

39. (currently amended) A ball grid array (BGA) package, comprising:

a substrate that has opposing first and second surfaces, wherein said substrate has a window opening through said substrate that is open at said first surface and said second surface;

a stiffener that has a first surface attached to said second surface of said substrate, wherein said stiffener further has a second surface having a mounting location for an integrated circuit (IC) die; and

a heat slug that has a first surface attached to a portion of said first surface of said stiffener through said window opening, wherein said heat slug has a second surface that is capable of being mounted to a printed circuit board (PCB);

wherein said portion of said first surface of said stiffener includes a first portion of a locking mechanism and said first surface of said heat slug includes a second portion of said locking mechanism, wherein said locking mechanism aligns said heat slug with said stiffener when coupled together.

40. (currently amended) The package of claim 39, wherein said second portion of said locking mechanism includes a surface bump on said first surface of said heat slug; and

wherein said first portion of said locking mechanism includes a slot in said portion of said first surface of said stiffener that corresponds to said surface bump;

wherein said surface bump fits into said slot when said first surface of said heat slug is coupled to said portion of said first surface of said stiffener through said window opening.

41. (previously presented) The package of claim 40, wherein said locking mechanism further includes an adhesive material to adhere said surface bump in said slot.

42. (currently amended) The package of claim 39, wherein said first portion of said locking mechanism includes a surface bump on said portion of said first surface of said stiffener; and

wherein said second portion of said locking mechanism includes a slot in said first surface of said heat slug that corresponds to said surface bump;

wherein said surface bump fits into said slot when said first surface of said heat slug is coupled to said portion of said first surface of said stiffener through said window opening.

43. (previously presented) The package of claim 42, wherein said locking mechanism further includes an adhesive material to adhere said surface bump in said slot.

44-60. (cancelled)

61. (withdrawn) A method of assembling a ball grid array (BGA) package, comprising the steps of:

(A) attaching a surface of a stiffener to a surface of a substrate that has a window opening therethrough to allow a portion of the surface of the stiffener to be accessed through the window opening; and

(B) attaching a first surface of a heat slug to the accessible portion of the surface of the stiffener through the window opening, wherein the heat slug has a second surface that is capable of being mounted to a printed circuit board (PCB);

wherein step (B) includes the step of

(1) aligning the first surface of the heat slug with the accessible portion of the surface of the stiffener using a locking mechanism.

62. (withdrawn) The method of claim 61, wherein step (1) includes the step of:
fitting a surface bump on the first surface of the heat slug into a slot on the accessible portion of the surface of the stiffener.

63. (withdrawn) The method of claim 62, wherein step (B) further includes the step of:

(2) using an adhesive to adhere the surface bump in the slot.

64. (withdrawn) The method of claim 61, wherein step (1) includes the step of:
fitting a surface bump on the accessible portion of the surface of the stiffener into a slot on the first surface of the heat slug.

65. (withdrawn) The method of claim 64, wherein step (B) further includes the step of:

- (2) using an adhesive to adhere the surface bump in the slot.

66. (withdrawn) A method for a forming a locking mechanism to align a stiffener with a heat slug in a ball grid array (BGA) package, comprising the steps of:

forming a bump on a surface of the heat slug; and

forming a slot in the surface of the stiffener, wherein the bump is capable of fitting into the slot when the surface of the heat slug is attached to the surface of the stiffener.

67. (withdrawn) A method for a forming a locking mechanism to align a stiffener with a heat slug in a ball grid array (BGA) package, comprising the steps of:

forming a bump on a surface of the stiffener; and

forming a slot in the surface of the heat slug, wherein the bump is capable of fitting into the slot when the surface of the heat slug is attached to the surface of the stiffener.

68. (new) The package of claim 39, wherein said second surface of said heat slug attaches to the PCB when the package is mounted to the PCB.

69. (new) The package of claim 39, wherein said first portion of said locking mechanism is centrally located on said portion of said first surface of said stiffener.

70. (new) The package of claim 39, wherein said second portion of said locking mechanism is centrally located on said first surface of said heat slug.

71. (new) The package of claim 39, wherein said second portion of said locking mechanism consists of a surface bump on said first surface of said heat slug;

wherein said first portion of said locking mechanism consists of a slot in said portion of said first surface of said stiffener that corresponds to said surface bump;
and

wherein said surface bump fits into said slot when said first surface of said heat slug is coupled to said portion of said first surface of said stiffener through said window opening.

72. (new) The package of claim 71, wherein said surface bump is centrally located on said first surface of said heat slug.

73. (new) The package of claim 71, wherein said slot is centrally located on said portion of said first surface of said stiffener.

74. (new) The package of claim 71, wherein said locking mechanism further includes an adhesive material to adhere said surface bump in said slot.

75. (new) The package of claim 39, wherein said first portion of said locking mechanism consists of a surface bump on said portion of said first surface of said stiffener;

wherein said second portion of said locking mechanism consists of a slot in said first surface of said heat slug that corresponds to said surface bump; and

wherein said surface bump fits into said slot when said first surface of said heat slug is coupled to said portion of said first surface of said stiffener through said window opening.

76. (new) The package of claim 75, wherein said surface bump is centrally located on said portion of said first surface of said stiffener.

77. (new) The package of claim 75, wherein said slot is centrally located on said first surface of said heat slug.

78. (new) The package of claim 75, wherein said locking mechanism further includes an adhesive material to adhere said surface bump in said slot.